

CHAPTER 880 UNDERGROUND DISPOSAL

Topic 881 - General

Index 881.1 - Introduction

This section deals with the use of drainage basin and drainage well infiltration systems for the disposal of storm water runoff. Exclusive reliance on conventional storm drain systems for disposal of roadway drainage, particularly in rapidly growing urban areas, is often a problem. In many regions, nature intended for surface runoff to soak back into the earth and customary disposal practices prevent it from doing so.

Where the terrain is flat and there are few natural channels it can be unreasonably costly to construct and maintain a conventional storm drain system and outfall. Drainage basins and drainage wells may offer a solution to that problem.

881.2 Recharge Consideration

There are two major considerations entering into the design of drainage basin or drainage well infiltration systems. These are the quantity and the probable quality of the runoff to be handled. Obviously, the facility must be large enough to handle a specified volume associated with a frequency of runoff. The volume needed and the percolation rate of the surrounding soils will dictate the size of the underground disposal system. There must also be an escapement designed into the system allowing surface overflow, or subsurface rise in the pressure gradient.

If the predicted, or measured, pollution population is too high, then primary, and possibly secondary treatment procedures are required prior to turning the captured runoff into a recharge pond or injection well. Refer to Index 110.2 for further discussion on control of water pollution.

881.3 Maintenance Considerations

(Text later)

881.4 Economics

(Text later)

881.5 References

The following publications contain design parameters and other useful information pertaining to the design and construction of an infiltration drainage disposal system.

- Caltrans report, "Infiltration Drainage of Highway Surface Water", July, 1980.
- FHWA design guidelines manual, "Underground Disposal of Storm Water Runoff".

Topic 882 - Infiltration Systems

882.1 Basins

Where no other means of disposal exist, storm waters may be discharged into natural or excavated depressions and stored until dissipated by infiltration and evaporation. After the ground has become saturated, there will be little percolation during a storm and evaporation will be negligible until the rain stops. The only significant computation is the capacity of the basin. Generally, stream waters should be passed without storage, and only roadway drainage water be considered for temporary storage.

It is important, under some situations, to know how long it will take the stored water to dissipate after a storm. Percolation rate and underground conditions should be determined. The percolation rate can be improved in many cases by ripping hardpan, loosening the soil, or installing drainage wells down to more pervious layers. In localities where long term ponding would be objectionable, extensive well systems or pumping may be required for final disposal.

882.2 Trenches

(Text Later)

882.3 Wells

Drainage wells are gravel filled vertical drains which filter and discharge storm water into pervious substrata. A thorough investigation is necessary to establish the existence, location, and capacity of the pervious layers. The initial cost of drainage wells is moderate, but their capacity and service life may be impaired by clogging. Silt and debris can create a continuous maintenance expense where flows carry excessive solids.

Where drainage wells have clogged, dry wells have been used successfully, however frequent cleaning is necessary. The well is lined with cribbing or perforated casing and no gravel filler is used. Covers must be designed for protection of persons and vehicles, but must be removable for easy maintenance.

Topic 883 - Environmental Considerations

(Text Later)

Topic 884 - Legal Considerations

884.1 General

Since the disposal of storm waters into water bearing strata is restricted by law, the approval of the local water pollution control authority is required. Refer to Index 110.2 for information on statutory regulations.